

for active library stack area, particularly periodicals, in part for library storage and in part for storage of unworked herbarium specimens accumulated over the past twenty years. These specimens represent horticultural as well as non-horticultural species and the collections are from China, India, Indo-China, Burma and countries of South America. As staff time permits, these collections will be identified, specimens added to the horticultural or the non-horticultural herbarium and duplicates distributed to other organizations. This accumulation of unworked material represents a sizable investment of Arboretum funds and will involve several thousand hours of professional staff time before the study of them is completed.

Three staff members retain offices on the upper floors of the building. The rooms formerly occupied by the library are empty at the present time and available for increases either in the staff or the horticultural activities of the Arboretum.

Concomitant with the establishment of distinct and organized resources for the field of horticulture, the Arboretum has been able to establish a firmer foundation for the work of its staff in the study of plants not under cultivation and in the native floras of the world. The non-horticultural specimens and books moved to Cambridge, now properly housed in Cambridge in steel cases in a dust-free building under controlled environmental conditions of humidity and temperature, are available for more efficient use by the staff of the Arboretum and by professional colleagues at Harvard and elsewhere. The relatively short distance between the Arboretum's horticultural collections at Jamaica Plain and its non-horticultural collections in Cambridge allows easy interchange of materials and ideas. In Cambridge the Arnold Arboretum's collections are housed for the first time in the same building with the Arboretum's wood and pollen slide collections, the Gray Herbarium, and the paleobotanical collections; and these are adjacent to the excellent facilities of the Museum of Comparative Zoology, the Botanical Museum and the Biological Laboratories. Already these combined and adjacent collections have proved mutually advantageous and useful to Arboretum staff members, as well as to those of the other institutions and to visiting botanists. The Arboretum's books and specimens are being used more than ever before, to the benefit of all.

With the completion of the physical rearrangements in Jamaica Plain, the majority of the herbarium staff turned its attention to the collections of specimens and books which had been moved to Cambridge. The Gray Herbarium had completed its move before any materials were removed from Jamaica Plain. The books of the Gray Herbarium had all been placed on steel shelving occupying one side of the library stack area. Before the books of the Arboretum were transferred to Cambridge they were all carefully catalogued and each book, pamphlet, folio volume or reprint was properly identified with an embossed seal of the Arnold Arboretum on the fly leaf and on several selected pages in the volume. The inner cover face bore a bookplate of the Arnold Arboretum and labeled on the back of many of the books was the inscription, "Library of the Arnold Arboretum." All books as they are bound or rebound are to be so inscribed. Pamphlets and

similar items bear or will bear an adhesive sticker with the same inscription. The books were arranged on the steel shelves of the other half of the library stack area in the same arrangement which they previously had. Folio volumes are located on special steel folio shelves at one end of the library stack area and are retained in a horizontal position. During the months which have elapsed since the completion of the move of those books to Cambridge, primary attention has been given to correct cataloguing and to the condition of the books. Already we can notice improvement in the condition of the books under the controlled humidity and temperature. Bindings treated in the usual library fashion are holding up better than before.

In planning the moving of the herbaria of the Gray Herbarium and the Arnold Arboretum, it was decided to incorporate the two collections in one phylogenetic sequence based on a modified Engler-Prantl system of classification. This was the system previously used by both herbaria. The adoption of a single sequence instead of maintaining two independent herbaria in the one building was based on our future plans for integration of the two collections. As the Gray Herbarium moved first, the cases holding herbarium specimens from that institution were spaced on the floors to house the total herbarium. The 440 new herbarium cases purchased for the building were also spaced in a general floor plan. The herbarium specimens of the Arnold Arboretum previously stamped on each sheet with the seal of the Arnold Arboretum were moved in their cases or in the cardboard boxes which housed these specimens in Jamaica Plain. The specimens in steel cases were interpolated in available space in the new building near the same families of the Gray Herbarium sequence. The specimens in the smaller cardboard boxes were placed on top of the new and empty cases in the approximate proper location in the sequence. The planning was almost one hundred per cent perfect. With the cases in place, each case was carefully aligned and wedged for proper fit with adjacent cases and for proper function and seal. Felts were replaced on nearly all the cases. These felts had been treated with insecticide and each case was reexamined and determined to be insect-free or was fumigated immediately.

During the remainder of the fall and winter months, some of the herbarium staff worked continuously to incorporate those herbarium specimens housed in cardboard boxes into the sequence of classification housed in steel cases. It required 166 of the new steel cases to house properly the Arboretum specimens formerly kept in cardboard boxes. During the spring months the Arboretum staff undertook another long-neglected task, that of inserting the specimens which had been mounted in recent years. At the end of this fiscal year these housekeeping tasks are nearing completion. For the first time in over twenty years all of the Arboretum's organized collections are housed in steel herbarium cases. For the first time in nearly twenty years, all of the Arboretum's organized collections are in one systematic sequence.

There remains ahead for the staff of the Arnold Arboretum and that of the Gray Herbarium the task of placing in association the specimens of

each family, genus and species. While all specimens of a given family are now on the same floor and generally within a few cases or rows of cases from each other, it is hoped to organize these specimens gradually in proper proximity. This is a long task and it is planned to spend several years in completing the process. The major move of two large herbaria and libraries has been completed with only brief interruptions in the availability of the materials. During the move all the normal service and professional activities of the Arnold Arboretum continued without interruption. New programs were started, old programs were maintained. The majority of the staff worked devotedly at the task of maintaining and furthering the preeminent position of the Arnold Arboretum among the institutions of its kind in this country and in the world.

The Staff:

It is with regret that the staff loses through retirement during the past fiscal year two of its members, Professor Irving Widmer Bailey as Professor of Plant Anatomy and Miss Ethel Upham as Herbarium Assistant. Professor Bailey joined the staff of the Arnold Arboretum in 1933 and has been primarily responsible for the development of the wood, slide and pollen collections of this institution. He served as a member of the editorial board of the *Journal of the Arnold Arboretum* from 1941 to the present and was a frequent contributor to the pages of the *Journal* during that period.

Miss Ethel Upham joined the Arboretum staff as secretary in 1945 but her abilities as an editorial assistant and herbarium assistant enabled her to play a contributory role to the many facets of this institution.

In September, 1954, Dr. Carroll E. Wood, Jr., joined the staff of the Arboretum as Associate Curator. Dr. Wood received his Ph.D. from Harvard University and was Associate Professor of Botany at the University of North Carolina immediately before his appointment. With an interest in horticulture and in the flora of the southeastern United States and as a capable teacher and field botanist, Dr. Wood is a valuable addition to the staff. Among his many duties, he is in charge of the adult education program at the Arboretum.

Mr. Roger Coggeshall was appointed head propagator on July 1, 1954, following the resignation of Mr. Lipp.

Honors came to several of the staff members during the past year. Professor Bailey was awarded the Mary Soper Pope award by the Cranbrook Institute of Science at the meeting of the American Academy of Arts and Sciences at Berkeley, California. At the Commencement of Harvard University on June 16th, Professor Bailey was awarded an honorary Doctor of Science degree with the citation, "Today your university salutes you for your direction of botanical study and for your accomplishment in searching, in the anatomy of plants, for clues to the miracle of growth."

Dr. Donald Wyman was reëlected a trustee of the Massachusetts Horticultural Society at its annual meeting and Dr. Richard Howard was elected chairman of the nomenclature section of the Ninth International Botanical Congress. Dr. Kobuski was elected to the council of the New England

Botanical Club and also serves as assistant curator of the herbarium of the club.

Members of the staff officially represented the Arnold Arboretum at various scientific and horticultural meetings throughout the country during the year. Dr. Carroll Wood, Dr. Richard Howard and Dr. Hu attended the annual meeting of the American Institute of Biological Sciences at Gainesville, Florida, in September. Dr. Wood served as chairman at one of the meetings and Dr. Howard took part in symposia sponsored by the American Society of Plant Taxonomists on the "Origin of the Coastal Plain Flora" and by the Society for the Study of Evolution on "The Origin and Evolution of the Biota of Florida." Dr. Howard served as president *pro tem* at the annual banquet of the American Society of Plant Taxonomists. Dr. Hu spoke on her work on *Paulownia*.

Professor Bailey represented the Arnold Arboretum at the meetings of the Botanical Society of America and the American Association of Arts and Sciences.

Mr. Roger Coggeshall served as moderator of two symposia at the annual meeting of the Plant Propagators Society in Cleveland. Both Dr. Sax and Mr. Coggeshall presented papers at the New England Regional Meeting of the American Society of Horticultural Sciences held in Cambridge.

Dr. Sax was chairman of a section of the conference on mutations held at the Brookhaven Laboratory in New York and was a consultant at the radiation biology conference held by the Biology Department of the Oak Ridge National Laboratory.

The demand for members of the Arboretum staff as speakers to various meetings was high and it is impossible to list all the groups concerned. Dr. Howard was the principal speaker at the Wellesley College Garden Day program and spoke on "Hurricanes and Horticulture." Dr. Howard also presented one of the downtown lectures for the New York Botanical Garden, where he talked on "Horticultural Highlights of the Caribbean Islands." He talked about the work of the Arnold Arboretum to the Chestnut Hill Garden Club, the Kiwanis Clubs of Jamaica Plain and West Roxbury, the American Begonia Society and to the Tree Wardens of Middlesex County and on other topics to the Garden Clubs of Lowell and West Roxbury, Massachusetts, and the Garden Club of Short Hills, New Jersey, as well as the Womens Club of Worcester, Massachusetts, and of Western Massachusetts. Dr. Wood talked on "Pollination of Plants" at a meeting of the Boston Horticultural Club and of the Gardeners and Florists Club of Boston. Dr. Wyman was one of the principal speakers at the Michigan Landscape Conference of Michigan State College, where he spoke on "New Plants for Contemporary Homes"; at the New York Botanical Garden's Rose Day, where his subject was, "The Wild Roses of the World" and the Rhode Island Shade Tree Conference when he talked on the subject, "Using Trees Wisely." Dr. Wyman spoke to garden clubs in areas ranging from Charlotte, North Carolina, to Durham, New Hampshire.

Mr. Williams spoke to the Milton Garden Club on pruning and Mr. Coggeshall was speaker at meetings of the Garden Clubs of West Roxbury,

New Bedford, Wareham, Marblehead and Cohasset on the subject of plant propagation. Mr. Coggeshall also spoke on the subject of "How an Arboretum Can Aid the Nurseryman" during the short course for nurserymen at the New York Agriculture School at Farmingdale, New York.

Horticulture:

Two devastating hurricanes ripped through the Arboretum in late August and September with Hurricane "Carol" on August 31st doing the more damage. Four hundred trees were either blown down or severely damaged. The ground force was able to pull back to an upright position and thus save approximately 25% of these within ten days of the storm. A brush chipper and two chain saws were bought with funds restricted to hurricane repair to aid in the process of cleaning up the debris. Small consolation for the loss could be found in the fact that the brush chipper supplied mulch for the remaining trees. By early spring most of the downed trees had been removed but the damage to branches will require many additional months of careful pruning and tree repair. Of all the trees blown down in these storms, only seven were not duplicated elsewhere in the collections. Attempts were made immediately to propagate these seven clones. All of the clean-up work was accomplished by the regular ground force, but the emergency made impossible the annual fall planting schedule.

The hurricanes were followed by a severe open winter. Nevertheless, the flowering display on the grounds during the spring months was one of the best in recent years. The dove tree bloomed profusely and with special publicity was sought out by many visitors. Equally outstanding in the quantity of bloom were the lilacs and the rhododendrons. The Dexter Rhododendrons fortunei hybrids on Hemlock Hill have never bloomed as well as they did this year.

Although lilac blight was fairly prevalent in surrounding areas this year, there was practically none in the Arboretum due to timely spraying with Puratized Apple Spray. The same can be said of fire blight on the crab apples which have received experimental treatments with "Agri-mycin" one of the newer antibiotics.

Lawn areas in the Arboretum received special applications of fertilizer this spring and the other collections were continued on the regular rotation program of application of fertilizer. Spraying for insect and disease control has taken a great deal of time, forty-seven man days in the past year, but the collections reflect the extra attention given them.

Two hundred and fifty species and varieties of plants were added to the major collections in Jamaica Plain during the year. Most of these represented plants new to the living collections of the Arnold Arboretum, although a few were planted to replace some of the older specimens. Plant materials collected by Dr. Wyman in Europe in 1952 and since held in post entry quarantine were released during the year and are now being propagated for the Arboretum collections and for distribution. Thirty new varieties of rhododendron were either purchased or given to the Arboretum